# PROJECT SUMMARY
# HOPI ARSENIC MITIGATION PROJECT
# TRIBAL CONTRIBUTION
# HOPI INDIAN RESERVATION
# NAVAJO AND COCONINO COUNTIES, ARIZONA

PROJECT NO. PH 14-U62
PUBLIC LAW 86-121

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
PHOENIX AREA OFFICE

JUNE 2014

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**INTRODUCTION**

In November 2010, the Hopi Tribe requested the Indian Health Service's (IHS) assistance to advance an arsenic mitigation strategy to address water quality issues affecting residents of the First and Second Mesas on the Hopi Indian Reservation. The Tribe has received an Environmental Protection Agency (EPA) Drinking Water Tribal Set-Aside grant to assist in the construction of the Hopi Arsenic Mitigation Project.

It is proposed in this project to begin construction of the HAMP, starting in the vicinity of Upper Sipaulovi and Upper Mishongnovi. Total estimated cost of the scope of work of this Project Summary is $985,000. The EPA is contributing all project funding for this work through an EPA-DWTSA grant.

**EXISTING SANITATION FACILITIES**

Water Supply: In January 2001, the USEPA reduced the drinking water MCL for arsenic from 50 ppb to 10 ppb. Effective January 2006, all public water systems were required to meet this revised standard. Since 2006, the tribal water systems serving the Hopi Villages of First and Second Mesa have been out of compliance with regard to arsenic. Arsenic concentrations in the First and Second Mesa area range from approximately 12 ppb to 20 ppb.

Three of the affected villages (Shungopavi, Sipaulovi, and the FMCV) signed Compliance Plans with the USEPA, Region 9, in 2011, agreeing to bring their respective water systems into compliance with the arsenic MCL by January 23, 2015.

In June 2006, the Hopi Tribe received a USEPA Drinking Water Tribal Set-Aside grant to develop a feasibility study to explore arsenic mitigation compliance strategies (IHS Project PH06-D33). Through an MOA, the Hopi Tribe requested that the Indian Health Service assist the Tribe in completing an arsenic mitigation

study for the First and Second Mesa region. Based on the findings of this investigation, the IHS recommended that arsenic treatment options be avoided to the greatest extent practical and that the arsenic mitigation focus should be directed to non-treatment options. Conveying arsenic compliant water from a proposed well field in the Turquoise Trail region was deemed the preferred strategy for addressing the area's ongoing arsenic compliance challenges. This concept became known as the Hopi Arsenic Mitigation Project.

In 2008, the IHS funded a project to further assist the Tribe in developing the HAMP concept (IHS Project PH08-T38). The project was funded specifically to evaluate the existing Hopi water systems, determine pipeline routes and alignments, identify right-of-way issues, and to conduct an environmental assessment of the HAMP.

In 2010, the Tribe received a DWTSA grant for $ 1.9M (IHS Project PH10-E37), through an Inter-Agency Agreement with the IHS, to further explore and substantiate the HAMP concept. The scope of work defined in the 2010 DWTSA grant included a hydrogeologic study, a utility management plan, and well drilling activities in the Turquoise Trail area.

In 2011, the USEPA awarded the Tribe another DWTSA grant, for $1.1M (IHS Project PH11-E55), and in 2012 awarded the Hopi Tribe an additional DWTSA grant for $1.2M (IHS Project PH 12-E73), which provided funding for additional planning activities and construction funding for a portion of the HAMP.

USEPA has been actively funding the HAMP with the goal of assisting the Tribe in implementing a long-term sustainable arsenic compliance solution. The IHS and the Hopi Water Resources Program, with support from the Tribe, have been actively engaged in advancing the project through public outreach, planning, and preliminary engineering activities. The IHS is committed to assisting the Tribe with engineering and technical support. The HAMP scores high in the IHS Sanitation Deficiency System, but is beyond IHS funding capabilities to fund in its entirety.

**Shungopavi** - The existing Shungopavi water system consists of one well producing approximately 65 GPM and one 250,000-gallon elevated water storage tank. One pressure zone serves the entire village with pressure being provided by the elevated storage tank. A new well was drilled in Shungopavi in 2008,

which exhibited high arsenic concentrations of 33 ppb. The well was subsequently never put into service.

The Shungopavi water system currently serves 146 residential service connections, no commercial, and three "other" water service connections.

**Upper Mishongnovi/Sipaulovi** - The Upper Sipaulovi/Mishongnovi water system consists of two pressure zones, one well which produces approximately 9 GPM, one 16,000-gallon water storage tank and one hydropneumatic tank with a corresponding booster pump.

The Upper Sipaulovi/Mishongnovi water system currently serves 25 residential service connections, no commercial, and one "other" water service connection.

**Lower Mishongnovi/Sipaulovi** - The Lower Sipaulovi/Mishongnovi water system consists of one well which produces approximately 90 GPM, a 75,000-gallon water storage tank, and a gravity-fed distribution system. The distribution system is connected with the BIA SMDS water system, through a normally closed gate valve, allowing emergency service to the SMDS, as needed.

The Lower Sipaulovi/Mishongnovi water system currently serves 100 residential service connections, three commercial, and five "other" water service connections

**Polacca (First Mesa Consolidated Villages, FMCV)** - The existing FMCV water system spans four pressure zones. Drinking water for the entire system is currently produced from two functioning wells, which are identified as Wells #6 and #8. These wells each have capacities of approximately 100 GPM. Wells #1, 2, 3 and 4 have been abandoned, and wells #5 and 7 are currently not in use. Pressure zone #1 is the uppermost zone and services the homes on top of the mesa. Subsequent zones are labeled in order of decreasing elevation. Pressure zone #1 has an 8,000 gallon storage tank and a 1,000 gallon hydropneumatic tank with a corresponding booster pump. Pressure zone #2 consists of a 500,000 gallon "floating" water storage tank (Polacca East Tank) fed by well #8 and provides service to a few higher elevation homes located below the mesa. Pressure zone #2 feeds pressure zone #3 through two pressure reducing valves (PRV #8 and #9) and generally serves the majority of Polacca homes north of Highway 264. Pressure zone #3 feeds pressure zone #4 through a series of five PRVs (PRVs #6, 4, 3, 2, 1) located along and just north

of Highway 264. Pressure zone #4 generally serves homes south of Hwy 264 and east of the Hospital/Polacca West System which is served by the 200,000 gallon Polacca West Tank, Well #5, and, in back-up mode, by pressure zone 3 through PRV #7. Water is boosted from pressure zone #2 up to pressure zone #1 via a small duplex booster pump station.

The FMCV water system currently serves 580 residential service connections, 19 commercial, and 21 "other" water service connections.

**B.** Wastewater Disposal: Wastewater collection and disposal on the reservation is accomplished through a number of different methods. Seven of the villages have collection systems while only six operate disposal facilities. At Keams Canyon, the BIA operates both a collection system and disposal facility. Two of the schools have both a collection system and disposal facility and one school has only a collection system. Two Tribal facilities exist for collection and disposal. Most scattered homes are served by septic tank and drainfield systems. Outhouses are used extensively in older village areas.

**Second Mesa School** - Wastewater disposal for the school compound and surrounding houses consists of a 1.0 acre stabilization pond. The Mishongnovi-Sipaulovi pond also provides wastewater disposal for part of Toreva.

**Polacca (First Mesa Consolidated Villages, FMCV)** - The FMCV's wastewater disposal system includes a six cell lagoon treatment system totaling 9.9 acres, with 14.8 acres of wastewater disposal area, making the total area of the wastewater treatment facility 24.7 acres. The facilities serve approximately 450 homes and 10 businesses.

**C.** Solid Waste Disposal: The Hopi Tribe, in conjunction with the IHS and a HUD Community Development Block Grant (CDBG), has developed a solid waste disposal program for the entire Reservation. A RCRA compliant landfill has been designed and constructed, and is now in operation on the Reservation.

**RECOMMENDED FACILITIES**

**A.** Water: The scope of work for this project includes commencement of construction of the Hopi Arsenic Mitigation Project.

The HAMP, as proposed, is a regional drinking water project that encompasses construction of a remote well field, regional water storage tanks, in-line booster pump station, and corresponding transmission pipelines, to convey water from the remote well field to the villages of First and Second Mesa. The proposed Turquoise Trail well field is located approximately 14 miles north of the Hopi Cultural Center in the vicinity of Route 8029 "Turquoise Trail". Water would be delivered to each of the affected villages via a pipeline/transmission system. The IHS commissioned a study known as the Hopi Water System Strategic Plan to estimate the operational costs of the proposed regional water system and to evaluate potential regional utility organization models. A new utility authority, the Hopi Public Utility Authority, has been established to manage and operate the proposed facilities. Each Village will maintain ownership of, and continue to operate and maintain, their respective water distribution systems, and will purchase bulk water from the proposed regional utility through a master water meter. In this model, the HPUA will act as a water wholesaler to the villages. Villages may be given the option of turning over their respective facilities to the regional utility authority under some future arrangement.

**B.** Sewer: No wastewater disposal facilities are recommended under this Project. Projects are underway or are being planned to improve sewer facilities on the Reservation.

**C.** Solid Waste: No solid waste facilities are recommended under this Project. Existing facilities are adequate.

**ENVIRONMENTAL CONSIDERATIONS**

IHS conducted an environmental review of the scope of work under this project in accordance with IHS environmental review policies. The review indicates that an environmental assessment is required for the greater regional project. The environmental assessment funded under IHS project PH 11-E55 will be completed prior to the commencement of construction.

**OPERATION AND MAINTENANCE (O&M)**

The proposed facilities constructed under this project will be operated and maintained by a Tribally endorsed management entity to be defined in the "Hopi Water System Strategic Plan". The strategic plan was funded by EPA in 2010 under Project PH 10-E37 and is currently in final draft form, with an estimated

completion timeframe of August 1, 2014. The strategic plan will clearly define how the proposed facilities will be operated and maintained.

**COST ESTIMATE**

Total estimated cost to construct the HAMP is estimated to be $16.914 million. This contribution toward the HAMP project is being funded through the Hopi Tribe form its EPA-DWTSA grant. It is anticipated that construction will be completed by the Tribe through Tribal procurement. However, it is also possible that construction will be completed via government contracting. IHS will work with the Tribe to determine and execute construction through the preferred procurement method. Any work to be constructed through Tribal procurement will be approved in accordance with the MOA. Architectural and engineering consultant services may be invoked for certain aspects of the project. Such consultant services may be obtained through Tribal procurement or an IHS government contract.

# UPPER SIPAULOVI/MISHONGNOVI 2014 DWTSA HAMP COST ESTIMATE

**Schedule A: Project Planning & Design**

| Item | Description | Quantity | Units | Units Cost | Total |
|---|---|---|---|---|---|
| 1 | Geotechnical Investigation (as needed for WST) | 1 | LS | $ 25,000.00 | $ 25,000.00 |
| | | | | Planning & Design Total: | $ 25,000.00 |

**Schedule B: Construction**

| Item | Description | Quantity | Units | Units Cost | Total |
|---|---|---|---|---|---|
| 2 | 6" Water Main, 235 PSI rated | 10,000 | LF | $ 30.00 | $ 300,000.00 |
| 3 | 6" Gate Valves | 7 | EA | $ 1,500.00 | $ 10,500.00 |
| 4 | Air Relief Valves | 2 | EA | $ 2,750.00 | $ 5,500.00 |
| 5 | Altitude Valve & Vault | 1 | EA | $ 30,000.00 | $ 30,000.00 |
| 6 | 110,000 gallon Water Storage Tank | 1 | LS | $ 165,000.00 | $ 165,000.00 |
| 7 | Master Meter | 1 | EA | $ 10,000.00 | $ 10,000.00 |
| 8 | Road Excavation and Repair - Unpaved Open Cut | 2,400 | LF | $ 26.00 | $ 62,400.00 |
| 9 | Paved Road Crossing - Bore with Casing | 150 | LF | $ 480.00 | $ 72,000.00 |
| 10 | Sipaulovi/Mishongnovi Disinfection Facility | 1 | EA | $ 30,000.00 | $ 30,000.00 |
| 11 | Power Extension to Disinfection Facility | 1 | EA | $ 15,000.00 | $ 15,000.00 |
| | | | | Construction Total: | $ 700,400.00 |

| | | | |
|---|---|---|---|
| Planning & Design Total (Schedule A) | | $ 25,000.00 | |
| Construction Total (Schedule B) | | $ 700,400.00 | |
| O&M Support Total (Schedule C) | | $ - | |
| Contingency (Schedules A, B, & C) | | $ 72,540.00 | 10.00% |
| | | Subtotal | $ 797,940.00 |
| | | | |
| TERO/Tribal Tax | 0.5% | $ 3,989.70 | |
| Tribal Procurement 1=YES, 0=NO | 1 | | |
| Tribal Administrative Support Fee | | $ 15,958.80 | |
| | | Subtotal Tribal Fees | $ 19,948.50 |
| | | | |
| PROFESSIONAL FEES: | | | |
| IHS Engineering Program Support (EPS) | | $ 47,876.40 | 6.00% |
| | | Subtotal Professional Fees | $ 47,876.40 |
| | | | |
| IHS Project Technical Support Fee (PTS) | | $ 119,691.00 | 15.00% |
| | | Subtotal PTS | $ 119,691.00 |
| | | | |
| | | Total Phase Cost | $ 985,455.90 |
| | | Rounded | $ 985,000.00 |

PH 14-U62__COST SUMMARY:

| | |
|---|---|
| Maximum Contribution to Tribe | $817,433 |
| IHS Project Technical Support | $119,691 |
| IHS Engineering Program Support | $ 47,876 |
| Total | $985,000 |

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HOPI INDIAN RESERVATION
NAVAJO AND COCONINO COUNTIES, ARIZONA

PROJECT NO. PH 14-U62
PUBLIC LAW 86-121

PREPARED BY:

| | |
|---|---|
| _____ | _____ |
| Date | Adam Hughes, P.E.<br>Project Engineer |

REVIEWED BY:

| | |
|---|---|
| _____ | _____ |
| Date | Robert Lorenz, P.E.<br>District Engineer |

APPROVED BY:

| | |
|---|---|
| _____ | _____ |
| Date | Eric Matson, P.E., Acting Director<br>Division of Sanitation Facilities<br>Construction |

**EXHIBIT 5 NEW PROJECT OR MODIFIED PROJECT APPROVAL FORM**
**PHOENIX AREA INDIAN HEALTH SERVICE SANITATION FACILITIES PROJECT**

| ASSIGNED PROJECT NUMBER | PROJECT TITLE AND DATE | TOTAL PROJECT ESTIMATED COST | |
|---|---|---|---|
| PH 14-U62 | HOPI ARSENIC MITIGATION PROJECT | IHS | $ |
| | HOPI RESERVATION | TRIBAL | $ |
| | JUNE 2014 | EPA | $985,000 |
| | | TOTAL | $985,000 |

**PROJECT DESCRIPTION:** AERIAL MAPPING, GEOTECHNICAL INVESTIGATIONS, ENVIRONMENTAL ASSESSMENT, DRAINAGE STUDY AND CONSTRUCTING A PORTION OF THE WELL TRANSMISSION MAIN IN SUPPORT OF AN ARSENIC MITIGATION WATER SYSTEM PROJECT ON THE HOPI INDIAN RESERVATION.

UNDER AND PURSUANT TO PUBLIC LAW 86-121 AND THE AUTHORITY DELEGATED TO ME, I HEREBY APPROVE THE SANITATION FACILITIES PROJECT OR MODIFIED PROJECT OUTLINED IN THE ATTACHED PROJECT SUMMARY OR AMENDED PROJECT SUMMARY DESCRIBED ABOVE.

THIS ACTION: __X__ APPROVES A NEW SANITATION FACILITIES CONSTRUCTION PROJECT
_____ APPROVES AN AMENDMENT TO A PREVIOUSLY APPROVED PROJECT
_____ INCREASES THE COST ESTIMATED OF A PREVIOUSLY APPROVED PROJECT

NEGOTIATION OF NECESSARY AGREEMENTS OR AGREEMENT AMENDMENTS RELATED TO PROJECT EXECUTION, CONTRIBUTIONS, AND RESPONSIBILITIES FOR OPERATION AND MAINTENANCE OF THE PLANNED FACILITIES MAY NOW BE INITIATED. NEGOTIATIONS SHALL BE BASED UPON THE PROJECT SUMMARY OR AMENDED PROJECT SUMMARY AS APPROVED. INDIAN HEALTH SERVICE COMMITMENTS SHALL NOT EXCEED THE ESTIMATED SET FORTH ABOVE.

THE ASSIGNED PROJECT NUMBER SHALL BE UTILIZED ON ALL CORRESPONDENCE AND DOCUMENTS RELATED TO THIS PROJECT.

ADAM HUGHES, P.E. IS HEREBY DESIGNATED AS PROJECT OFFICER AND SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL ACTIVITIES RELATED TO THE EXECUTION OF THE PROJECT.

UPON RECEIPT OF A "REQUEST FOR TRANSFER OF FUNDS BETWEEN PUBLIC LAW 86-121 PROJECT ACCOUNTS" FROM THE AREA OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING, THE AREA FINANCIAL MANAGEMENT OFFICER IS HEREBY INSTRUCTED TO ESTABLISH A NEW PROJECT ACCOUNT IF NECESSARY AND TO TRANSFER INTO SUCH ACCOUNT OR PREVIOUSLY ESTABLISHED ACCOUNT AN AMOUNT EQUAL TO THE ESTIMATED COST SET FORTH ABOVE LESS AMOUNTS PREVIOUSLY TRANSFERRED. OBLIGATIONS AND EXPENDITURES RELATED TO THE PROJECT ARE TO BE CHARGED TO THIS ACCOUNT.

FUND CERTIFICATIONS:

DATE: _____

FUNDS IN THE AMOUNT OF THE IHS ESTIMATED COST LESS AMOUNTS PREVIOUSLY TRANSFERRED TO THIS PROJECT ARE AVAILABLE IN THE AREA AND RESERVED FOR THIS PROJECT.

_____

AREA FINANCIAL MANAGEMENT OFFICER

APPROVAL RECOMMENDED:

_____ _____

DIRECTOR, DIVISION OF SANITATION FACILITIES CONSTRUCTION — DATE

CONCURRENCE:

_____ _____

ASSOCIATE DIRECTOR, OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING — DATE

_____ _____

DIRECTOR, PHOENIX AREA INDIAN HEALTH SERVICE  DATE

cc: SERVICE UNIT DIRECTOR
DIR., IHS, ATTN: DIR., OEH
AREA FINANCIAL MGM'T OFFICER